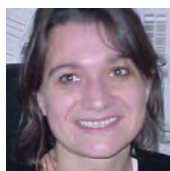


Editorial

Operational challenges and uptake in prevention and treatment of malnutrition



By Myriam Ait Aissa

Myriam Ait Aissa leads the Action Against Hunger Research and Analyses Department, which overall aim is to produce evidence for better action. Before joining Action Against Hunger, she worked for the Scientific Department of ACTA International, a French applied agricultural research institute, as a research fellow. Her work focused on nutrition and food security research areas.

The second Lancet series on undernutrition was a key milestone in the global call for more robust evidence on nutrition sensitive and specific interventions (Lancet, 2013). Academics, non-governmental organisations, national stakeholders and donors have been increasingly involved in operational research to improve the effectiveness of a set of multi-sectoral interventions for better prevention and/or treatment of undernutrition. Donors and policy-makers regularly reaffirmed their needs for more robust results to orient their policies. This has led to a significant increase in research concerned with humanitarian nutrition programming and policies in crises settings (Blanchet, 2015). While channels to publish or communicate results exist, they offer limited space for sharing learning on process implementation and research uptake by relevant stakeholders. There is no specific space dedicated to the presentation of scientific results on nutrition in humanitarian settings.

To help fill this gap, Action Contre la Faim (ACF) organised in Paris on November 9th 2016 the first annual international conference entitled "Research for nutrition - operational challenges and research uptake in prevention and treatment of undernutrition". ACF's longstanding experience in programming and operational research in humanitarian settings, active research portfolio on malnutrition prevention and treatment, and openness to share challenges as well as successes, meant we were well placed to convene this gathering. The conference had two main objectives: to present a selection of the latest research related to the identification of effective nutrition specific and sensitive interventions in crises contexts; and to provide a space for discussion and debate about nutrition research methodological design and uptake challenges. Almost 200 individuals participated, with 12 international universities, 16 international non-governmental organisations (INGOS) and seven donors represented.

Two panel debates explored operational research challenges and research uptake considerations; proceedings are summarised in this issue of Field Exchange. In both sessions, panellists and plenary participants explored common experiences and themes. Research shared in presentations spoke to key evidence gaps the international community is working on:

- *Impact of cash transfers on undernutrition:* In recent years, a set of robust studies were launched to assess the effects of cash transfers on nutrition. Preliminary results of two randomised controlled trials assessing the effects of cash transfers on wasting in Burkina Faso and Pakistan were presented.
- *Anthropometric assessment of undernutrition:* A significant area of research interest is to identify nutritional vulnerability in children, including but not limited to anthropometric indicators. One study explored identification of wasting, and outcomes amongst infants under 6 months of age in Bangladesh; a second investigated the association of mortality risk with different anthropometric measures.
- *Impact of water, sanitation and hygiene (WASH) activities on undernutrition:* A recent movement, "Wash In Nut", aims to orientate WASH programmes to improve nutrition treatment and prevention outcomes. Evidence of the effects of such strategies on nutrition are still missing. The results of two fascinating randomised controlled trials in Chad were presented.
- *Health service delivery models for acute malnutrition:* There has been recent drive and a number of initiatives to strengthen malnutrition treatment services within health systems, at national and local levels and within communities. Two approaches being researched were presented from Burkina Faso and Mali. Of particular note, research on characterisation of MAM in Burkina Faso should allow for better future treatment strategies.



Pierre Micheletti, Vice-President of ACF France, opens the conference

Maurine Ific

Presented research that is available is summarised in this special section of Field Exchange 54, with headlines and key contacts provided for study results not yet available.

Feedback on the conference was extremely positive, reaffirming the importance and relevance of having dedicated time and space for researchers, practitioners and donors to exchange, discuss and reinforce collaboration on a spectrum of nutrition research with a strong operational focus. ACF is already preparing for the 2017 conference with a view to this becoming an annual event to share, think and innovate around nutrition research in humanitarian settings.

For more information, contact: Myriam Aissa, email: maitaissa@actioncontrelafaim.org

To view video footage of the day, visit: <http://bit.ly/2kDgLnQ>

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Methodological challenges for operational research in the humanitarian context

By Myriam Ait Aissa and Melchior de Roquemaurel



Myriam Ait Aissa leads the Action Against Hunger Research and Analyses Department, which overall aim is to produce evidence for better action. Before

joining Action Against Hunger, she worked for the Scientific Department of ACTA International, a French applied agricultural research institute, as a research fellow. Her work focused on nutrition and food security research areas.



Melchior de Roquemaurel coordinated the Action Against Hunger Research for Nutrition Conference #R4NUT.

This article summarises contributions from Yves Martin-Prével, Institute for Research on Development (IRD); Kate Golden, Concern Worldwide; Timothy Williams from the SPRING project; Victoria Sibson, UCL; Myriam Ait-Aissa, ACF, and plenary discussion during the ACF research conference, Paris, 2016.

Box 1 Research experience of panellists

In 2015 UCL and Concern collaborated to test the effectiveness of an early seasonal randomised controlled trial (RCT) to prevent acute malnutrition in rural Niger. This was one of three studies by the ACF-led consortium REFANI (www.actionagainsthunger.org/refani). Concern also conducted an RCT on a 'community resilience to malnutrition' integrated programme in Chad. Action Against Hunger research department has a multidisciplinary team and currently has a portfolio of six RCTs and seven observational studies recently completed/in progress.

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is USAID's flagship, multi-sector nutrition project focused on reducing stunting and anaemia among children in the first 1,000 days. SPRING has conducted operations and implemented research and evaluations in over 10 countries to guide USAID nutrition programmes and contribute to the global evidence base.

The ACF research conference, Paris, 2016 included a panel discussion on the operational challenges of research in humanitarian contexts¹. This article summarises the session. The discussion was moderated by Yves Martin-Prével of the Institute for Research on Development (IRD). Panellists were Kate Golden from Concern, Timothy Williams from the SPRING project, Victoria Sibson from UCL and Myriam Ait-Aissa from Action Against Hunger.

The panellists shared some of the operational challenges they have experienced in a number of recent research studies (see Box 1) and suggested recommendations to improve the overall quality and efficiency of research on nutrition in humanitarian contexts. The studies in question focused on stunting and/or severe acute malnutrition and/or chronic undernutrition, involving experimental and observational designs. Discussions largely centred on experiences with randomised controlled trials (RCTs) in complex settings.

Challenges related to RCTs

RCT methodology is often used for nutrition research in humanitarian contexts and is acknowledged as the 'gold standard' in terms of quality of evidence. Nevertheless, implementing an RCT in a humanitarian crisis context poses many challenges.

Humanitarian programmes operate within strict and often circumscribed and short-term, donor-driven timeframes, whereas scientific research often requires a lengthier period for implementation.

In some contexts, RCTs are not feasible: a well-designed observational study may be better than a poorly implemented RCT. Nevertheless, RCTs are feasible in many humanitarian contexts, even in volatile situations. Critically, researchers must remain mindful of the context and 'expect the unexpected', which typically impacts the length and cost of the research. For example, there may be security issues during randomisation, a pipeline breakdown in nutritional products, or sudden difficulty in population access. An acute conflict or natural disaster may occur on top of a chronic emergency situation. From a research perspective, with the right attitude and preparedness, these are manageable situations and sometimes research consequences may be limited, e.g. an event may impact on the control and intervention groups equally. However, researchers must often engage in lengthy discussions with operations teams concerned with the challenges and risks of implementing research in volatile contexts. In a multi-sector research project, these

conversations are multiplied by the number of sectors involved. Good communication with all parties regarding the project's purpose and objectives can help minimise adverse impacts.

RCTs are important but can be a 'risky' investment for non-governmental organisations (NGOs). From the outset, funding can limit the scope of investigation, such as limiting study arms to a control and one intervention. Where no impact is found in a trial, programme teams may be disheartened by the lack of a clear 'positive' or immediately actionable result. This is particularly true when extraordinary efforts by the programme team have been required to carry out an RCT in challenging contexts. To help address this, a mixed-methods approach, including other elements such as qualitative research, monthly surveillance and process evaluations alongside RCTs, can help ensure practical learning takes place that can be applied even if the headline results are less 'exciting'.

Conducting experimental studies on nutrition requires investment in robust context analysis to document impact pathways or process evaluations, given that nutrition is context-specific, multi-sectorial and related to seasonality. It is important to implement qualitative methodologies, capture seasonal features and take the necessary time for full analysis of all monitored indicators, involving experts from the field, operations and academia.

Funding challenges

Funding timing and flexibility is an ongoing challenge in humanitarian contexts. Programme and research funding sources are typically distinct, with different timeframes and donor requirements. For example, the REFANI project research element was funded by DFID, while programme activities were funded by ECHO. Programme funding was not fully committed until several months after the research funding was secured and study preparations needed to start, including hiring staff. This required both the research and programme partners to plan flexibly and to spend research funds before the trial was 100% guaranteed to happen. Single-source funding that covers both research activities and the intervention(s) would allow better coordination of activities. It would also facilitate study designs that could answer the most relevant questions, rather than just those permitted by the current programme design.

¹ To view a video of this panel debate, visit: <http://bit.ly/2jwmmKx>



Bridget Fenn, ENN, contributing to plenary discussion

Managing the unexpected in research requires donor flexibility. Delays mean extended deadlines are often required. Having a financial envelope for unplanned events is key in the implementation phase, empowering researchers with the flexibility and reactivity needed to respond quickly to change.

Challenges with human resources

Establishing international and national staff teams is not straightforward. Cultural sensitivity is important but is seldom taken into account or given the priority it needs. Capacity development of national staff is often a 'tick-box' exercise without proper investment; agencies and donors need to take it seriously to have an impact. Also, we often fail to appreciate that capacity development is two-way; national staff have a wealth of contextual knowledge that is critical to the implementation of field research.

Experiences from the REFANI Project in Niger and ACF research have found that recruiting national staff with the necessary research skills and experience is challenging. This has led to operational/support staff not being hired as planned and overburdening some existing staff, who became responsible for both research and programme activities.

A number of lessons were learned. First, it is important to be realistic when recruiting research staff where capacity is known to be limited, i.e. appoint international staff or include capacity-building for national staff if time and budget permit. Secondly, recruit adequate numbers of extra personnel to support the implementation of research activities. Thirdly, having a part-time database manager is invaluable, given the need for remote data management in many contexts. Finally, paying casual-hire enumerators bonuses for undertaking all data collection rounds (e.g. baseline, mid-term and endline studies) saves time and money, helps build capacity (e.g. through refresher training) and supports data quality. Staff turnover at field level is common; for REFANI, the

oversight and continuity of an HQ-based research coordinator was a successful element in the research implementation.

Monitoring and indicators

Data collection

During the Concern research studies, many personnel hired as study staff had different expectations about the quality and types of data collection required, given their experiences of working for NGOs rather than academic institutions (which have more rigorous standards for data quality). External parameters such as deteriorating security can constrain access for international research staff, which limits opportunities for researchers to provide support and oversight. For example, during the UCL REFANI study, data collection was undertaken with increasingly limited access for UCL's international research staff due to deteriorating security. To compensate, the team conducted relatively lengthy trainings and hired consultants to provide support as trainers and supervisors. Tablets were used for data collection which posed some practical challenges but at the same time facilitated real-time access to recently collected data at office level in Tahoua, Niamey and London. This proved invaluable for remote data management.

Indicators

Having a comprehensive theory of change regarding nutrition-related issues is key to understanding research findings. To be truly effective, research needs to go beyond simple quantitative frequencies to learn which programme components contribute to improved nutrition outcomes; how and why; and whether the results are generalisable. Rigorous quantitative methods, complemented by qualitative research, are necessary to answer these questions. SPRING has successfully used mixed-methods research in several countries, but finding time and resources to fully analyse data, especially qualitative data, remains challenging.

Project indicators, while important for accountability, have limitations: they may under-emphasise or fail to capture key factors which can have direct impact and could benefit decision-making. Outcome indicators are unique to each country, making cross-country comparisons difficult. At country-level, however, they do allow for tailoring research and evaluation to local needs. This can help build ownership and investment, since the indicators measure what is directly relevant to countries.

Monitoring

Research challenges usually relate to project management, particularly regarding data collection and monitoring. Quality data collection and management can be lacking in the nutrition and health sectors. It is therefore essential to invest in good monitoring and evaluation systems and link this with observational research, resulting in strong data being embedded in programmes. This requires working with operation teams, better use of the field data documented routinely or through audit, and opening discussions around

this. Investing in a good MEAL (Monitoring, Evaluation, Accountability, and Learning) system is key. Action Against Hunger, for example, is working on a tool (NEAP: Nutritional Evaluation Assessment; <http://bit.ly/2ktDtuW>) to improve the assessment of nutritional outcomes in programmes at field level.

Ethical dilemmas

Control groups present an ethical dilemma, particularly in resource-constrained settings. The idea of targeting an intervention based on random selection rather than on need presents operational agencies with a real quandary. In Concern's experience, ways were found to leverage a control or comparison group while maintaining what was considered an acceptable level of accountability to the communities with which they work.

In Chad, the same intervention was provided to the control group, albeit three years later. In Niger, a comparison group – not a full control group – was used, whereby both study arms received the same total amount of cash but over six months versus four months. In Somalia, the control group (an internally displaced persons (IDP) camp close to the IDP camp receiving the cash intervention) was not randomly assigned. It was identified after it had not been prioritised to receive cash following an independent targeting process. The study team had also devised an alternative study design and analysis plan in the event that the control camp did become a target for cash; as it turned out, this did not happen during the three-month study period.

Research data sharing is also a challenge; a fundamental question is whether data should be accessible to all. Open data is transforming research methods and data treatment.

Multi-sector approaches and partnerships and international partnerships

The implementation of longitudinal studies increasingly requires multidisciplinary approaches and the creation of international (and national) spaces to enable the necessary connections and partnerships. Formal structures where NGOs and academics convene are rare. Creating a formal forum for partnerships to develop can be critically important. Even where financial and time constraints limit this type of collaboration, we must try to capitalise more on sharing past experiences and greater investment in multi-sector approaches.

Conclusion

Detailing the operational challenges of conducting research in humanitarian contexts is important. It is also important to invest in longitudinal and multidisciplinary studies to help understand the causes of undernutrition and the means to manage it. These studies should be complemented by in-depth observational studies. Such ambitious projects should be managed by consortiums of NGOs and academics, supported by donors willing to invest and innovate.

How to ensure quality research uptake

By Stephanie Stern



Stephanie Stern leads the Action Against Hunger *LAB* project which aims to reinforce the impact and uptake of knowledge. Before joining Action Against Hunger, she worked for the Strategy & Analysis Department of Save the Children International and was a research fellow at IRIS, the French think tank on international relations and strategic affairs. Her work focused on the transformation of the humanitarian system.

The ACF research conference, Paris, 2016, included a plenary session and panel discussion on how to ensure research uptake for nutrition research in emergencies. This article summarises this session, reflecting contributions from Patrick Kolsleren, Gent University (moderator); Abdoulaye Ka, Undernutrition Unit of the Senegalese Prime Minister's office; Zvia Shwartz, Uptake and Communication Manager for the REFANI project; and Mahaman Tidjani Alou, Abdou Moumouni University of Niamey, and plenary session panel discussion.

Defining research uptake

The discussion began with panellists sharing perspectives on what constitutes research uptake. Zvia Shwartz asserted how important it is to define 'research uptake' and what it entails before any research uptake strategy (RUS) or activities are put in place. The definition agreed upon by all partners for the REFANI project was: "The process whereby research findings are communicated and utilised by a target audience." The definition, and associated strategy and activities, was based on the premise that continuous stakeholder engagement and dissemination of evidence will ultimately lead to research uptake. Tidjani Alou suggested that sharing research findings that have social implications is a means to create appetite that can galvanise "social agitation", as described by the sociologist and philosopher Jürgen Habermas (Calhoun, 1992) around subjects of interest.

Two fundamental questions are: "How do we ensure evidence is utilised by key stakeholders, both in policy and practice?" and: "When should research uptake activities begin?" The panel reflected that an efficient RUS is more than just a sum of activities; it is a continuous process that should take place throughout the entire research project cycle, with various challenges and opportunities. These were examined in more detail during panel exchanges and plenary discussion; a selection of these insights follows.

Uptake challenges

Academic and operational partners may have different interests when collaborating on research together. It is important to find a happy medium between producing robust evidence and publishing findings in journals, and sharing results with stakeholders as quickly as possible. Academics typically seek robust evidence and finalised results before making any statements on findings or engaging in dissemination; this may conflict with operational partners who want to apply the results as quickly as possible and rapidly influence policy and practice.

Researchers tend to move on once a research project is completed, yet this is when the critical dissemination and communication to key stakeholders needs to take place to ensure maximum impact. At the same time, continuing local stakeholder engagement and local dissemination can be difficult once a project has finished.

Keys to success and attention

Improving communication

Continuous engagement with stakeholders is critical. Project information should be shared as it becomes available, e.g. through conferences, meetings with various stakeholders and donors and by hosting specific events. Communication with stakeholders should not wait until results are published, but should start from the very beginning, when research questions are elaborated. But while traditional methods (publications, public and technical debates, conferences, etc) have a role, these routes are arguably limited; they do not create genuine open dialogue. This reflects a missing link between researchers and practitioners that enables coherent dialogue; practitioners and

researchers may speak to each other, but not truly understand or hear what the other is saying. The two communities have different logics and ways of thinking. A third specialism may be needed, comprising individuals capable of understanding the research results and translating them into practical and understandable information. This concept has been described as "social mediation" (Nassirou Bako-Arifari et al, 2000); social mediators support the research during the entire process and once the results are issued, work with the public sector to see where they can make things change.

A critical question, given that knowledge produced can have political and social impact, is: "What is the researchers' responsibility in mediation?" An example was shared from Niger where research on water points enabled resolution of decades-long conflict between two villages regarding land issues. The researchers were involved in mediation with local government. Such mediation by researchers has limitations as he/she may have limited familiarity with the context.



Research uptake panelists (l to r): Patrick Kolsleren, Abdoulaye Ka, Mahaman Tidjani Alou and Zvia Shwartz

Researchers publish in a format that is not accessible or is too technical for most stakeholders. Eighty-two per cent of articles published in the humanities are not even cited once. Of those articles that are cited, only 20 per cent have actually been read. Half of academic papers are never read by anyone other than their authors, peer reviewers, and journal editors (Lattier, 2016). The fora where research information is exchanged and discussed are not frequented by practitioner stakeholders and decision makers. Research information should be presented to stakeholders in a format that is short and gives a clear conclusion so that the information can be quickly translated into a decision. Important efforts are needed to improve communication between stakeholders and researchers and identify new ways to communicate coherently and succinctly.

Fulfilling users' expectations

Practitioners and agencies need evidence. The UN Food and Agricultural Organization (FAO), for example, is a "knowledge organisation" that works to create linkages between research and politics and between research results and policy and programming. The FAO works with research institutes on subjects defined by FAO; the primary goal is not scientific publication but to have a guidance note with a strong operational focus to help programmers and policy makers. More broadly, it was observed that there is often a discrepancy between expectations of the researcher and the final user. Scale-up is also an important issue; final users need guidance on how and whether results are scalable or applicable to other contexts.

Upstreaming research in strategic planning

There are important lessons to learn from upstreaming research in strategic planning at country level. In Senegal in early 2000, for example, evaluations were used to investigate the effectiveness of the national nutrition programme, which proved extremely useful to prove the impact of the approach and strategy. When the government decided to adopt a multi-sector approach to fight undernutrition, research played a key role in defining what needed to be implemented, supporting strategic and operational guidance. The multi-factor and multi-sector character of combatting malnutrition makes the challenge of ensuring coherence between the needs of researchers and operational actors even more interesting. At country level, we are typically tasked with setting up multi-actor, multi-service platforms at household, community and government levels. Research challenges play out at all tiers.

In Senegal, research is well positioned in nutrition policy as a transversal element to support the definition and effective implementation of strategies aligned with the needs of the country. It fuels the choices of different strategies in the planning stage, supports implementation by providing guidance on how to ensure the effectiveness of interventions and is fundamental in providing information to the M&E system to explain successes and failures.

Research still faces multiple challenges, including: the lack of French language publication/translation of research that hinders uptake in Francophone countries; how to adapt to different national and local contexts; the need to have dialogue with decision-makers and operational staff (practitioners); and the critical mass of skills that must be created to generate evidenced actions.

Bridging the gap between researchers and practitioners

A more holistic approach to knowledge management is needed, involving more than sporadic annual discussions and more open, transparent and continuous dialogue. We need to broaden our horizons and set up shared knowledge platforms, breaking down the divides that currently exist between researchers, practitioners and decision makers. This is how the Senegalese government is approaching its nutrition policy, gathering all the concerned stakeholders round the table – including academics and scientists engaged in all the different sectors impacting nutrition – and monitoring and evaluating the impact of this holistic approach.

Action-driven research

There are three dimensions to research uptake. There is the *needs* aspect that is the problem at hand; the *demand* side expressed as a need for information to support decision making; and the *offer*, i.e. what researchers produce. In an ideal situation, these three dimensions overlap, but often in practice they do not. Researchers offer research results within the perspective of their academic freedom. When this is *offer* only, the research may be innovative but is still perceived by stakeholders as useless, because it does not help them make decisions. From the *demand* side, stakeholders have difficulties expressing

their need for information in a format to which researchers can respond. Given that the research agenda is driven by external donors, the demand side cannot be met if the need does not fit donor priorities. Local funding for research is often lacking, so that local demand has little or no traction. Research to answer a particular question might not be innovative enough or too implementation-oriented, making chances of publication slim; academics may be less interested in pursuing such research from the outset.

Uptake of research results can be enhanced by identifying the questions stakeholders have from the beginning and responding with research to answer these questions specifically. Research uptake should be considered as a participatory process, engaging all the stakeholders at different levels and moments of the research cycle. Its efficiency lies in the combination of various elements: responding to a question which interests donors, stakeholders (including beneficiaries) and researchers and ensuring all the concerned actors are adequately informed and engaged in the research process, the dissemination of its results and their application to improved policies and practices.

To view a video of this panel debate, visit <http://bit.ly/2kAcisq>

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Patrick Kolsteren, contributing to plenary discussions

A cluster RCT to measure the effectiveness of cash-based interventions on nutrition status in Pakistan

Summary of conference abstract¹

By Bridget Fenn



Bridget Fenn is an epidemiologist with a background in nutrition. She is currently a consultant for the Emergency

Nutrition Network (ENN) and is Principle Investigator on the Research in Food Assistance for Nutrition Impact (REFANI) Pakistan study involving seasonal cash transfers (cash and vouchers) and their impact on childhood nutritional status in humanitarian settings.

Video footage of the conference presentation is available at <http://bit.ly/2kAe7e5>

Location: Pakistan

What we know: Evidence of the impact of cash-based interventions on nutrition outcomes is limited.

What this article adds: A four-arm (standard cash (SC), double cash (DC), fresh food voucher (FFV), control) parallel, longitudinal, cluster randomised controlled trial was implemented over six months by Action Against Hunger and ENN. Primary outcomes were weight-for-height z scores (WHZ) <-2 and mean WHZ in children under five years old. Preliminary results found a significant decrease in risk of being wasted (WHZ <-2) with DC only and significant improvements in mean WHZ for DC and FFV. All three interventions saw a significant decrease in both stunting and mean height for age. There was a significant decrease in mean haemoglobin (Hb) concentration for children and mothers in the FFV and for mothers only in the SC arm. A pathway causal analysis is underway that will greatly aid interpretation, with results available mid-2017.

Background

The Research into Food Assistance for Nutrition Impact (REFANI) consortium comprises two operational partners; Action Against Hunger (lead agency) and Concern Worldwide, and two academic/research partners; ENN and University College London (UCL). REFANI is a three-year research project funded by UK Aid and co-financed through funding from the European Commission (EU & ECHO). The overarching aim of REFANI is to increase the evidence base of cash-based interventions (CBIs) on nutrition outcomes in humanitarian settings by addressing a number of evidence gaps. The use of CBIs among humanitarian agencies to prevent wasting in children is increasing, but questions remain on how best to incorporate CBIs into emergency programmes to maximise their success in terms of improved nutrition outcomes.

The REFANI Pakistan study is a collaboration between Action Against Hunger and ENN, set in Dadu district, Sindh province. Dadu district is largely agrarian, dependent on crop production, livestock keeping and agriculture labour. The majority of the population are highly vulnerable to shocks, especially the poorest households, and there is a lack of alternative income sources, further constrained by lack of opportunities. Dadu district experiences frequent flooding, droughts and high temperatures (above 45°C).

Methods

This study involved a four-arm, parallel, longitudinal, cluster randomised controlled trial (cCRT) (registered trial number *ISRCTN107615320*). The protocol has been published¹. Three CBIs were implemented: two unconditional cash transfers (a 'standard cash' (SC) amount of 1,500 Pakistan Rupees (PKR) and a 'double' cash (DC) amount of 3,000 PKR) and one fresh food voucher (FFV) with a value of 1,500 PKR, which could be exchanged for specified fresh foods (fruits, vegetables and meat). A fourth arm acted as the control group and received no additional intervention beyond the basic activities implemented by Action Against Hunger that were provided to all groups. The SC was set to equal the amount disbursed by Pakistan's national safety net programme, the Benazir Income Support Programme (BISP). The cash components were disbursed on a monthly basis either by mobile banks that travelled to a central location for some of the participating villages or through central banks that served a number of villages. The FFVs were disbursed to participating

households at village level. All three interventions were delivered with verbal messages that children should benefit from the transfers.

The interventions were implemented over six consecutive months (July to December 2015) and targeted to mothers from poor/very poor households with a child 6-48 aged months at baseline. The implementation and the use of the CBIs were monitored both quantitatively and qualitatively through monthly questionnaires or quarterly focus group discussions and key informant interviews.

The main research question assessed the effectiveness of different CBIs at reducing the risk of undernutrition during the lean season. The primary outcomes were weight-for-height z scores (WHZ) <-2 and mean WHZ in children under five years old. The study also encompassed a mixed-methods process evaluation to help interpret the results and a costs and cost-effectiveness analysis (results not presented here).

Results

The results presented here are a summary of the short-term impact of CBIs on nutrition outcomes. The full analysis of both short and medium-term term impacts is forthcoming. The group with the higher amount of cash (DC) saw a significant decrease in risk of being wasted (WHZ <-2) compared to the control group. There were no significant differences in risk of being wasted for either SC or FFV arms. Both the DC and FFV arms saw significant improvements in mean WHZ compared to the control arm. All three interventions saw a significant decrease in both stunting (height-for-age z-score (HAZ) <-2 and <-3) and mean HAZ compared to the control group. In the FFV arm, there was a significant decrease in mean haemoglobin (Hb) concentration for children and mothers and for mothers only in the SC arm.

Lessons learned

The results have identified a number of questions that still need to be answered and for now require careful interpretation. In terms of risk of being wasted, we need a better understanding of why children in the DC arm were significantly less wasted. This will be attempted through a pathway analysis whereby different pathways in the causal framework will be quantified. It was

¹ Presented at the ACF research conference, November 9th, 2016.

¹ <http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-015-2380-3>

not possible to establish the minimum level of cash required to have a significant effect; we can only say that this threshold falls somewhere between the amounts allocated in the SC and the DC interventions.

Regarding mean WHZ, it appears that children in the FFV arm were getting fatter but not taller, especially if interpreted with the lack of improvement in being wasted. As well as this, the Hb levels of children and mothers in the FFV arm were significantly lower compared to the control group. We had hypothesised that the FFV would impact growth and micronutrient status through increasing dietary diversity. However, while all three arms showed a significant improvement in mother and child dietary diversity, this improvement was lowest in the FFV arm (highest in the DC arm). These results suggest that something unplanned was occurring in the FFV arm. It is pos-

sible that the vouchers themselves were too restricted, being dependent on what vendors stocked (such as chicken being the only available meat). There were also anecdotal reports regarding vendors overcharging for food items redeemed against the vouchers as a way to cover their own administration fees in recovering the voucher costs. In this respect, the actual transfer amount given may have been lower. Another question that needs to be addressed was the lack of improvement in Hb status in light of the improvements in ponderal growth and prevalence of being wasted as seen in the DC arm. The explanation for this will also be attempted through a pathway analysis. The study setting presented a number of difficulties affecting data collection. The baseline survey took longer than expected, since recruitment of female enumerators was difficult and the data collection coincided with Ramadan and reduced

working hours. Added to this, temperatures reached 52°C, which not only affected research team working ability but also had an effect on the haemocytes (this was managed).

Conclusion

The results illustrate the impacts of different CBIs on nutrition status. However, the theory of change regarding 'how' CBIs may influence nutrition outcomes in children is complex. In the RE-FANI Pakistan study, we show that it is not a straightforward task to simply interpret impact results as working or not; understanding the pathways and processes through which CBIs are implemented is essential to understand how best to implement them. Such analyses will be completed mid-2017.

For more information, contact: Bridget Fenn, email: bridget@enonline.net

Risk factors for severe acute malnutrition in infants <6 months old in semi-urban Bangladesh: a prospective cohort study to inform future assessment/treatment tools

Summary of conference abstract¹

By M Munirul Islam, Yasir Arafat, Nicki Connell, Golam Mothabbir, Marie McGrath, James Berkley, Tahmeed Ahmed, and Marko Kerac

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Video footage of the conference presentation is available at: <http://bit.ly/2kA6B33>

Location: Bangladesh

What we know: The burden of acute malnutrition in infants < 6 months varies by country. Community-based case management for uncomplicated cases is lacking.

What this article adds: A recent study investigated the prevalence of acute malnutrition in infants <6m in semi-urban Bangladesh (two seasons) and undertook a prospective cohort study to describe current outcomes of identified cases at six months (180 days) of age. Prevalence of acute malnutrition was low post-harvest but increased pre-harvest; from 0.4% to 5.9% for severe acute malnutrition (SAM) and 2.8% to 10.1% for global acute malnutrition. At age six months, 24% of identified SAM cases (by eight weeks of age) and referred for available treatment (inpatient), remained severely malnourished. A range of infant and maternal risk factors for infant SAM were identified, involving breastfeeding status, the nutrition and mental health of the mother, infectious disease and water/sanitation/hygiene. A package of care is warranted in this age group.

Current WHO guidelines on severe acute malnutrition (SAM) management recommend outpatient management of uncomplicated acute malnutrition in infants under six months of age (infants <6m), in line with the now-established treatment approach for older children (WHO, 2013). However, there is a lack of practical guidance on how to identify those infants <6m at risk

and how to manage them. Current WHO case definition for SAM in infants <6m is weight-for-length of less than -3 Z-score (WLZ); visible severe wasting; and/or bilateral pitting oedema.

To inform the development of assessment tools and treatment approaches for SAM in infants <6m, a

¹ Presented at the ACF research conference, November 9th, 2016.

study was conducted in semi-urban Bangladesh in 2015/2016 with the following objectives:

1. To estimate the prevalence of infants <6m with acute malnutrition in the community;
2. To develop an assessment tool/case definition checklist for infants <6m with acute malnutrition; and
3. To describe current outcomes following infant <6m with acute malnutrition.

The study involved two prevalence surveys (in distinct seasons) and a prospective cohort study of three infant groups (77 in each group), followed from 4-8 weeks to 180 days post-partum. The groups comprised:

Standard SAM:

WLZ <-3 and/or bipedal oedema;

Normal:

WLZ ≥-2 to <+2 z-scores, no oedema;

Expanded SAM:

MUAC <115mm but WLZ ≥-2, no oedema.

MUAC case definition does not exist for infants <6m; data were collected for research purposes only. Mother/caregiver interviews at enrolment assessed potential risk factors. Infants with 'Standard SAM' were referred to existing services for treatment (inpatient care) according to existing protocols. The primary outcome was nutritional status at age completion of 180 days.

Preliminary results

Prevalence survey

The prevalence of GAM and SAM were low in the post-harvest period but increased pre-harvest; from 0.4% to 5.9% for SAM and 2.8% to 10.1% for GAM. Severe underweight (weight for age < -3 Z-score (WAZ)) slightly increased (severe: 5% to 6.1% and severe/moderate combined, from 14.4% and 16.3%).

Cohort study

At enrolment, 'Standard SAM' and 'Expanded SAM' were younger than 'Normal' infants (5.1, 5.5, 6.5 weeks respectively, p<0.001). A selection of characteristics that differed between these

Table 1 Differentiating characteristics between cohorts

	Standard SAM	Normal	Expanded SAM	
Non-exclusive breastfeeding	34%	13%	23%	p=0.01
Duration of exclusive breastfeeding	3.9 weeks	5.7 weeks	4.5 weeks	p<0.001
Dissatisfaction with breastfeeding	22%	10%	7%	p<0.001
Mothers educated beyond school year five	56%	71%	77%	p<0.023
Maternal mental health/distress score (max score is 20)*	8.4	6.8	7.5	p<0.008
Maternal mid-upper-arm circumference	233mm	246mm	241mm	p<0.012
Infant illness episodes requiring hospitalisation	21%	6%	9%	p<0.001
Household income/month	\$89	\$114	\$114	p=0.007

* WHO Self Reporting Questionnaire 20. World Health Organization (WHO). A User's Guide to the Self Reporting Questionnaire. WHO/MNH/PSF/94.8. http://apps.who.int/iris/bitstream/10665/61113/1/WHO_MNH_PSF_94.8.pdf

groups at enrolment is shown in Table 1. Type of toilet was significantly different among the groups; Standard SAM had more people with a pit latrine vs. a flushing toilet compared to the other two groups. Handwashing and source of water were not significantly different among the groups. Duration of breastfeeding was not significantly different among the groups.

At age six months, ~24% of 'Standard SAM', 1% of the 'Normal', and 5% of 'expanded SAM' infants had SAM (p≤0.001). Three infants with 'Standard SAM' died; compared to none in the 'Normal' group and one in the 'Expanded SAM' group. In the Standard and Expanded SAM groups, significantly fewer infants were still being breastfed, more infants were fed anything other than breastmilk at enrolment and endline, and more infants were given animal milk at an earlier age, compared to the Normal group. Duration of exclusive breastfeeding was also shorter in both groups, mothers breastfed less often, had higher mental health/distress score and were significantly less satisfied when asked how breastfeeding was

going. Maternal Body Mass Index (BMI) and MUAC were lower in the Standard SAM group. More infants in the Standard SAM group had at least one episode of illness that required hospitalisation at enrolment; this proportion (21%) had increased to 40% by endline.

Challenges to implementing the research included:

- Access to villages in the rainy season; surveyors had to cross many bodies of water with equipment including motorbikes.
- Randomly selected villages were geographically spread out, so travel time was high.
- Measuring anthropometry in infants <6m is difficult, especially length.
- The number of questions in the questionnaire was a challenge as many were necessary to ensure comprehensiveness.

Discussion and conclusions

A range of maternal, infant and environmental risk factors are associated with SAM among infants <6m. Successful future treatments should focus on a package of care rather than single interventions that include breastfeeding support; the nutrition, physical and mental health of mothers; infectious disease management; and water/sanitation/hygiene conditions. Over one quarter of the infants identified with SAM at the outset remained severely malnourished at six months of age; this suggests inadequate provision and/or access to treatment of SAM and a risky environment. It is necessary to distinguish these vulnerable infants from those who had recovered by six months; indicators in addition to anthropometry are probably necessary.

For more information, contact: Nicki Connell, email: nconnell@savechildren.org

References

WHO. Guideline: Updates on the management of severe acute malnutrition in infants and children. Geneva: World Health Organization; 2013.



MUAC case definition does not exist for infants <6m; data were collected for research purposes only

Water, livestock, and malnutrition findings from an impact assessment of Community Resilience to Acute Malnutrition programme in Chad

Summary of conference abstractⁱ

By Anastasia Marshak, Helen Young and Anne Radday



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Video footage of the conference presentation is available at: <http://bit.ly/2jYbWC5>

Location: Chad

What we know: Evidence and mechanisms of impact are limited regarding programmes that combine nutrition with other interventions, such as health, water, sanitation and hygiene (WASH) and food security.

What this article adds: A randomised control trial impact evaluation was conducted of the Community Resilience to Acute Malnutrition (CRAM) project in Chad, a three-year, integrated, multi-sector programme. The findings indicate significant programme impact, particularly in relation to acute malnutrition, although prevalence of wasting (and stunting) remained high.

At endline, children in CRAM settlements were significantly better off, including lower prevalence of wasting, stunting and illness. WASH promotion activities also showed a significant positive impact of CRAM and were correlated to child nutrition outcomes. Differences in child outcomes between settled and former pastoralist communities may be explained by seasonal factors and livestock management practices affecting water contamination by cattle. This suggests access to clean water is not sufficient; hygiene of the supply chain also appears critical.

The Dar Sila region of eastern Chad experiences highly variable rainfall, seasonal food insecurity and high prevalence of acute malnutrition. In 2012, Concern Worldwide put in place an integrated programme that combines nutrition, health, water, sanitation and hygiene (WASH) and food, income and markets (FIM) provision in Dar Sila called Community Resilience to Acute Malnutrition (CRAM). The programme was designed to reduce child acute malnutrition in the face of seasonal shocks.

Concern collaborated with the Feinstein International Center, Friedman School of Nutrition Science and Policy at Tufts University to carry out a randomised control trial impact evaluation to better understand the level of programme impact and the mechanisms behind it. Three surveys took place in November and December of 2012, 2014 and 2015 in 69 settlements encompassed by the Concern programme area. This article summarises the impact of the CRAM programme and highlights household and community characteristics correlated with acute malnutrition in Dar Sila, Chad.

Method

The study covered 1,400 households, spread evenly between 69 settlements. The survey collected information on household demographics, socio-economic characteristics, food insecurity, access to natural resources, and child nutrition and morbidity. In addition, a

qualitative investigation was carried out in 2013, 2015, and 2016 using focus groups and key informant interviews.

All the data were adjusted for the sampling design and included population weights. To establish programme impact, logit and ordinary least squares (OLS) analysis regression models were used for binary and continuous outcome variables respectively. To take advantage of the panel nature of the dataset, a random and fixed effects model was run using the weight-for-height z-score (WHZ) of the child in the household with the lowest score as the outcome variable, simply referred to as 'nutritional status'.

Results

At the endline, children in the CRAM settlements performed significantly better than the non-intervention group on a host of key nutrition and health indicators. They had lower prevalence of wasting; higher WHZ; lower prevalence of chronic malnutrition (stunting); higher height-for-age z-scores (HAZ); and lower prevalence of illness (Table 1). Even when controlling for child, household and settlement characteristics using a random and fixed ef-

ⁱ Presented at the ACF research conference, November 9th, 2016. Full report: Anastasia Marshak, Helen Young and Anne Radday. *Water, Livestock, and Malnutrition. Findings from an Impact Assessment of Community Resilience to Acute Malnutrition Program in the Dar Sila Region of Eastern Chad, 2012-2015*. Feinstein International Center, December, 2016. <http://fic.tufts.edu/publications/>

Table 1 Nutrition and health indicators at endline (mean with confidence intervals in parentheses)

	Control	Treatment	Significance
WHZ	-1.13 (-1.29 to -0.98)	-0.85 (-1.02 to -0.66)	p < 0.05
Wasting (WHZ < -2)	0.21 (0.17 to 0.24)	0.15 (0.10 to 0.19)	p < 0.05
HAZ	-1.27 (-1.44 to -1.09)	-1.07 (-1.23 to -0.92)	p < 0.1
Stunting (HAZ < -2)	0.37 (0.33 to 0.40)	0.30 (0.26-0.35)	p < 0.05
Child sick in the past two weeks	0.37 (0.31 to 0.43)	0.28 (0.23 to 0.34)	p < 0.05



Anastasia Marshak

fects regression model, both being in the intervention group ($p < 0.1$) and moving from not receiving CRAM to receiving CRAM ($p < 0.1$) was significantly correlated to better household child nutritional status (i.e. minimum household WHZ).

The WASH promotion activities also showed a significant positive impact of CRAM and were correlated to child nutrition outcomes, specifically in relation to the following variables: greater utilisation of boreholes; greater reports of regularly washing the transport and storage container with soap; and greater knowledge around the two main times for handwashing (Table 2). However, the proportion of respondent's correctly practicing handwashing significantly decreased ($p < 0.05$) in the intervention settlements only, suggesting increased knowledge did not translate into changes in behaviour. A link was observed between water consumption and CRAM in relation to exclusive breastfeeding. Respondents in the intervention settlement were significantly more likely to exclusively breastfeed at the endline, primarily driven by a reduction in giving water to children under the age of six months (78% of mothers reported giving water in the non-intervention settlements versus 54% in the intervention settlements ($p < .05$)). In the regression analysis, utilisation of a borehole (as opposed to an open water source) was significantly ($p < 0.01$) and negatively correlated with child acute malnutrition. However, the same relationship was not observed in the non-intervention settlements, indicating a potential role for hygiene practices along the water chain in reducing contamination of water.

A possible source of water contamination is the concentration of cattle in a village. In the regression analysis, while individual livestock ownership correlated with better child nutrition outcomes ($p < 0.1$), as the concentration of cattle in a village increases, so do rates of acute malnutrition ($p < 0.05$). However, children who lived in former pastoralist settlements had consistently better nutritional status ($p < 0.05$), even though households in these settlements were significantly more likely to own more cattle ($p < 0.01$).

Table 2 WASH indicators at endline (% with confidence intervals in parentheses)

	Control	Treatment	Significance
Borehole utilisation	46% (33 to 60%)	79% (66 to 91%)	$p < 0.01$
Transport container cleaned once a week with soap, closed, and "looks" clean	12% (9 to 16%)	21% (15 to 26%)	$p < 0.01$
Know the two times for handwashing	57% (50 to 64%)	67% (60 to 74%)	$p < 0.05$

Differences in livestock management and seasonal location of livestock, uncovered in the qualitative research, may be driving this observed difference in child nutrition outcomes. Households in the former pastoralist damre communities, specialised in cattle production, reported migrating farther with their herds during the dry season to areas with permanent rivers. Village households brought their cattle back to the village at the height of the dry season and utilised nearby water sources, including the borehole.

Discussion

These findings indicate significant programme impact, particularly in relation to acute malnutrition. One cautionary note is that, for the duration of the programme, the prevalence of global acute malnutrition remained around 15% or above, while stunting prevalence was between 30 and 45%. There is no statistical evidence that CRAM reduced the rate of malnutrition in the intervention settlements; rather, unlike in the non-intervention settlements, malnutrition rates did not increase over time. These continuing high rates of acute malnutrition, and the increases seen in the non-intervention settlements, are causes for concern and indicative of the extreme vulnerability of these communities as they emerge from more than a decade of protracted crises. There is, however, greater resilience in CRAM settlements as a result of the programme.

The data also offer clues regarding the mechanisms related to impact and how impact could be increased. Using a borehole without proper training on the water chain does not in itself sig-

nificantly decrease rates of malnutrition. Routine water testing found that, while contamination levels (coliforms) of borehole water at the point of collection were low to non-existent, they increased at certain points along the water chain (from borehole to transport container to storage container). This finding suggests that the positive impact of CRAM on malnutrition may be via the WASH activities that are focused on reducing the risk of contamination of potable water further along the water chain. These activities promote good hygiene in relation to water containers.

A possible source of water contamination is the concentration of cattle in a village. The association between village cattle density and child nutritional status is a possible explanation of contamination. Previous literature had identified several pathogens associated with diarrhoea and death among infants. One of those pathogens – cryptosporidium parvum – is water-borne, is passed from cattle to humans, and has been shown to cause rather than simply exacerbate malnutrition.

These findings indicate that CRAM had a significant programme impact on both acute and chronic malnutrition. The evaluation also explored why the CRAM programme might have worked and how it could be improved. Access to clean water appears to play an important although not sufficient role; hygiene practices along the water chain might also be critical in preventing contamination along the water chain.

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Inflammation and moderate acute malnutrition in children: a cross-sectional study in Burkina Faso

Summary of conference abstract¹

By Bernardette Cichon



Bernardette Cichon is undertaking her PhD at the University of Copenhagen. She has an MSc in Public Health Nutrition from the London School of Hygiene and Tropical Medicine and more than eight years experience working with nutrition in humanitarian contexts.

The treatFOOD project¹ is a collaboration between ALIMA, MSF-Denmark and the University of . It was funded by DANIDA, MSF-Denmark, MSF-Norway, WFP, USAID, ECHO and Arvid Nilsson's Foundation.

Video footage of the conference presentation is available at: <http://bit.ly/2jYbWC5>

Location: Burkina Faso

What we know: The role of morbidity in moderate acute malnutrition (MAM) is not well understood.

What this article adds: An observational study in Burkina Faso, using baseline data from a randomised controlled trial, described morbidity and inflammation in children with MAM. Almost 90% of children with MAM in this setting had an infection and/or inflammation. Maternal history reported a 38% infection rate in the previous two weeks; 71.8% were ill on the day of visit. Most prevalent diagnosed illnesses were malaria (40.2%), lower respiratory tract infections (23.2%), and upper respiratory tract infections (14.6%); fever was common. A total of 10.7% and 46.5% of asymptomatic children had elevated acute phase proteins (CRP and AGP, respectively), suggesting sub-clinical infection. This was largely unexplained by maternal reports and clinical examination. More emphasis on identification and treatment of infections as part of MAM treatment and investigation into how this affects nutritional status and recovery is needed.

Background

Morbidity plays an important role in the development of and recovery from malnutrition. Morbidity in children with moderate acute malnutrition (MAM) has not been described in detail and it is unclear how morbidity compares to serum levels of acute phase proteins (APPs) which indicate systemic inflammation that can impede response to therapeutic nutritional interventions. The objective of this study was to describe morbidity and inflammation in children with MAM and to assess to what extent maternally reported and clinically diagnosed morbidity explains the variation in APPs.

Methods

The data for this observational study were baseline data collected as part the treatFOOD trial, a randomised controlled trial testing effectiveness of food supplements for treatment of MAM, carried out in the Passoré Province, Northern Region, Burkina Faso. Children aged 6-23 months with MAM, resident in the catchment area and whose parents/guardians consented to participate, were included. Recruitment took place from September 2013 until August 2014.

Socio-demographic, anthropometric and morbidity data were collected by trained staff. Morbidity data collection included a patient history based on 14-day maternal recall of symptoms and a physical examination carried out by study nurses. Venous blood (2.5 ml) collected from the arm was used for diagnosis of malaria, using a rapid diagnostic test (RDT), and to measure serum concentrations of C-reactive protein (CRP) and α 1-acid glycoprotein (AGP). Fever was defined as an axillary temperature $> 37.5^{\circ}\text{C}$. Upper and lower respiratory tract infections were diagnosed by experienced nurses based on an adapted version of the Integrated Management of Childhood Illnesses (IMCI) guidelines. Diarrhoea was defined as three or more loose, watery stools per day based on information provided by the mother. The thresholds used for defining

elevated APP levels were CRP $>10\text{mg/l}$ and AGP $>1\text{g/l}$. Multivariate ANCOVA models were used to explore the associations between morbidity and CRP as well as AGP. These models were also used to determine to what extent morbidity explains variation in APPs.

Results

A total of 1,609 children were enrolled in the study. Over half (54.6%) of participants were female. Prevalence of stunting (height-for-age <-2 z score) was 37.7%. The mean (SD) age was 12.3 (4.8) months.

Mothers reported illnesses in the two-week period prior to admission in 38% of children. Furthermore, 71.8% of children were ill on the day of the visit according to the physical examination by the study nurse. The most prevalent illnesses diagnosed by the nurse were malaria based on positive RDT (40.2%), lower respiratory tract infections (23.2%) and upper respiratory tract infections (14.6%). Fever was also common (17.7%). Almost a quarter (24.2%) and two thirds (66.4%) of children had serum CRP $>10\text{mg/l}$ and serum AGP $>1\text{g/l}$, respectively.

Positive malaria RDTs were more common among children admitted based on mid-upper-arm circumference (MUAC) only than children admitted based on weight-for-height z score (WHZ) only, after adjustment for age and sex (38% vs 26%, $p<0.001$). More children had lower respiratory tract infection if they were admitted based on WHZ only compared to MUAC only, after adjustment for age and sex (29% vs 21%, $p=0.006$). There were no associations between other symp-

¹ See www.treatfood.org

¹ Presented at the ACF research conference, November 9, 2016. Published research: B Cichon, F Fabiansen, CW Yaméogo, MJH Rytter, C Ritz, A Briand, VB Christensen, KF Michaelsen, R Oummani, S Filteau, P Ashorn, S Sheperd and H Friis. Children with moderate acute malnutrition have inflammation not explained by maternal reports of illness and clinical symptoms: a cross-sectional study in Burkina Faso. BMC Nutr. 2016;2:10.1186/s40795-016-0096-0.

toms, illnesses and APP levels and admission categories. A total of 10.7% (n=36) and 46.5% (n=157) of asymptomatic children had a CRP >10 mg/l and AGP >1 g/l, respectively. Only 19% of children had normal CRP and 12% had normal AGP in the absence of symptoms.

History of fever as well as nurse-documented fever, malaria, respiratory tract infections and skin infections were associated with higher levels of both APPs. History of cough and diarrhoea at the inclusion visit was associated with higher AGP only. Overall, morbidity data only explained a small amount of the variation in APP levels (adjusted R2 below 0.2 in all tested models).

Lessons learned

This cross-sectional study has shown that almost 90% of children with MAM in this setting had an

infection and/or inflammation. MAM treatment protocols usually only provide for supplementary food and routine medication such as deworming, vitamin A and iron and folic acid supplements. These results indicate a possible need for more emphasis on identification and treatment of infections as part of MAM treatment.

Furthermore, elevated APP levels in children without identified symptoms are not uncommon and morbidity data explained only a small proportion of the variation, as demonstrated by the adjusted R2 which was <0.2 in all models, both indicating a presence of sub-clinical inflammation. It is unclear what causes this sub-clinical inflammation and whether it affects nutritional status and response to treatment. Possible explanations for the sub-clinical inflammation cited by the authors include missed infections; the fact that APPs can rise during the incubation phase of

a disease before clinical symptoms become apparent or remain elevated during convalescence; and the presence of other conditions such as environmental enteric dysfunction (EED); recent vaccinations; cooking with biomass fuels; and exposure to toxins that may elicit an acute-phase response.

Conclusion

Morbidity among children with MAM in this setting is common but maternal reports and clinical examination explained only a small proportion of the variation in APPs, indicating a presence of sub-clinical inflammation. Further research is needed into the causes of this sub-clinical inflammation, as it could affect nutritional status and success of MAM treatment.

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Upcoming research shared at ACF research conference

At the ACF research conference, November 6th, 2016, experiences were shared from a number of studies where final results will be made available in 2017. A snapshot of what to expect, video footage of the conference presentations and contacts for the studies, are included below.

The PROMIS project: integrating the prevention of child undernutrition into community-based management of acute malnutrition programmes in Senegal, Mali and Burkina Faso

Innovative Approaches for the Prevention of Undernutrition (PROMIS) is a three-year (2014-16) project funded by Global Affairs Canada that seeks to prevent and improve the treatment coverage of acute in children in Burkina Faso, Mali, and Senegal. The intervention is implemented Helen Keller International and evaluated by the International Food Policy Research Institute (IFPRI) using mixed study designs. The PROMIS project looks to improve performance and beneficiary coverage of current community-based management of acute malnutrition (CMAM) programmes by integrating a package of preventive measures into child acute malnutrition (AM) screening offered by different delivery platforms. Impacts on child AM prevalence and incidence are hypothesised. In Mali and Burkina Faso, the programme's impact is assessed using a cluster randomised controlled design, while in Senegal, a smaller study assesses the programme's feasibility in a peri-urban setting.

In Mali, the delivery platform consists of monthly community health volunteers-led village gatherings of caregivers with children 6-23 months of age to screen children for AM and to deliver the enhanced preventive package (strengthened Behaviour Change Communication (BCC) on nutrition and health, and a small quantity of lipid-based nutrient supplement (SQ-LNS)). The comparison group receives monthly village-based group BCC and screening for child AM. In Burkina Faso, well-baby consultations (WBC) in health centres is the primary platform to offer monthly screening for AM among infants starting at birth. Caregivers of infants from 0-6 months allocated to the intervention group that participate in WBC receive strengthened BCC on nutrition and health after regular child AM screening. From the age of six months onwards, the provision of preventive SQ-LNS is added. The comparison group receives unspecific BCC as prescribed by the national policy. In Senegal, community health workers trained by local NGOs organise group

BCC, screen children for AM and distribute SQ-LNS to caregivers of children 6-23 months of age.

In Mali and Burkina Faso, the programme's impact is assessed by two study designs. A baseline-endline comparison study assesses the programme's impact on the prevalence of acute malnutrition, whereas a longitudinal study with monthly follow-up measurements during 18 months evaluates the preventive impact on the incidence of child AM. A mixed methods process evaluation assesses the programme's impact pathways and feasibility. Finally, a cost-effectiveness study will provide insight into the economic dimension of this integrated programme. Results will be available at the end of 2017 and throughout 2018.

Video footage of the conference presentation is available at: <http://bit.ly/2k8Zodl>

For more information, contact: Lieven Huybregts, email: L.Huybregts@cgiar.org

Effects of multi-annual seasonal unconditional cash transfers on young children’s nutritional status and morbidity in Burkina Faso: the MAM’Out trial

The MAM’Out research project aims to test the effectiveness and cost-effectiveness of a seasonal and multiannual cash transfer programme, likely to influence multiple underlying causes of undernutrition. The two-arm cluster randomised controlled trial was implemented in 2015 and 2016 in Burkina Faso. The study was informed by a Nutrition Causal Analysis that identified a number of perceived causes of undernutrition in the population: women’s financial insecurity, inadequate birth spacing and poor access to potable water. A formative re-

search was conducted to assess the relevance of a cash based intervention and provided detailed operational guidance on the target population, the type of cash transfer, the seasonality, the delivery mechanism and the amount to transfer. Participating households in the intervention group were offered seasonal unconditional cash transfers (UCTs) from July to November, over two years (2013 and 2014). A monthly allowance of 10,000 XOF (≈US\$17) was given by mobile phone to mothers, identified as primary recipients of the transfers. Mothers were told that the

cash transfer was to support their child’s development and to prevent undernutrition. Trained data collectors performed home visits on a quarterly basis to collect quantitative data such as child anthropometrics and morbidity, socio economic and demographic indicators. Results will be published in 2017.

Video footage of the conference presentation is available at <http://bit.ly/2kAaAMG>

For more information, contact: Freddy Houngré, email: fhongbe@actioncontrelafaim.org

Effectiveness of adding a household WASH-package to a routine outpatient programme for severe acute malnutrition in Chad – the Ouadi’nut study

Action Contre la Faim is currently implementing a cluster randomised controlled trial in Mao and Mondo health districts, Kanem region in Chad, in partnership with the Institute of Tropical Medicine in Antwerp, Belgium, and the Sahel Association of Applied Research for Sustainable Development (ASRADD) in Chad. The study is investigating the effectiveness of adding a household water, sanitation and hygiene (WASH) package to a routine outpatient programme for severe acute malnutrition. The aim is to protect children against new episodes

of diarrhoea and other WASH-related infections, and to contribute to nutritional recovery. The household WASH-package includes: 1) Household water treatment and hygiene kit (water container, water disinfection consumables, soap, cup, simple hygiene promotion leaflet with images); 2) Weekly hygiene promotion sessions at health centre level with others/caretakers of children admitted to the programme. Primary evaluation outcomes are recovery and relapse proportions. Secondary outcomes include time-to-recovery, weight gain, longitudinal preva-

lence of morbidity (diarrhoea, vomiting, cough, and fever), and adherence to the household WASH-package, hygiene and care practices of the mothers/caretakers.

The trial is registered at clinicaltrials.gov under the identifier: NCT02486523. The final results and recommendations will be published in 2017.

For more information, contact: Mathias Altmann, maltmann@actioncontrelafaim.org

Delivering SAM treatment through community health workers in Mali

Community-based management of severe acute malnutrition (SAM) has increased access to treatment, but coverage of cases remains inadequate. Experience from other platforms show that modifications to the service delivery model, such as the delivery of malaria, pneumonia and diarrhoea health services by Community Health Workers (CHWs) at community level, can lead to over 90% coverage of affected cases. More evidence is needed to develop a similar model using CHW for the treatment of SAM, to allow Ministry of Health to adapt treatment models to deliver higher coverage and perform-

ance. A clinical, prospective, multi-centre cohort study was conducted between February 2015 and February 2016 by ACF in Kita in Southwest Mali, to investigate if SAM treatment delivered through CHWs is as effective as treatment delivered at health facilities. Secondary objectives were to assess the coverage, quality of care and cost-effectiveness of the intervention compared to routine outpatient care. One cohort (consisting of four health centres) followed a traditional outpatient model of treating SAM (control group) and the second cohort (consisting of three health centres) used CHWs to treat uncomplicated SAM cases in

the community (intervention group). The allocation of treatment between the two groups was randomised. Clinical outcomes (cure, death and defaulter rates), cost effectiveness, treatment coverage and quality of care were examined in both the control and intervention groups. Results will be made available in 2017.

Video footage of the conference presentation is available at: <http://bit.ly/2jboaKj>

For more information, contact: Pilar Charle, email: pcharle@accioncontraelhambre.org